University of Maine **Penobscot County** **Orono, Maine** **A-204-77-1-A**	**Departmental** **Findings of Fact and Order** **New Source Review** **Amendment #1**

After review of the air emissions license amendment application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., §344 and §590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	University of Maine (UMaine)
CURRENT PART 70 LICENSE NUMBER	A-204-70-A-I
LICENSE TYPE	06-096 CMR 115, Minor Modification
NAICS CODES	611310
NATURE OF BUSINESS	Educational Facility
FACILITY LOCATION	Orono, Maine
NSR AMENDMENT ISSUANCE DATE	July 1, 2008

B. Amendment Description

UMaine submitted a New Source Review (NSR) application to add two diesel back-up generators to the facility's license. The application also included a request to allow the two new generators and two of the existing licensed generators to be operated on a limited basis during times when the demand on the regional power system is predicted to be at or near its annual system peak.

C. Emission Equipment

The following new equipment is addressed in this air emission license:

Generators

Equipment	Max. Design Capacity (MMBtu/hr)	Power Output (kW)	Firing Rate (gal/hr)	Fuel Type, % sulfur
Recreation Center Generator	4.6	400	32.7	Diesel, 0.05%
Hilltop Commons Generator	5.8	550	41.4	Diesel, 0.05%

UMaine has requested clarification in the license to allow the two new generators, plus two of the existing generators at the Engineering/Science Building and the Alfond Arena, to be operated during predicted system peaks. The Engineering/Science Building Generator is 3.2 MMBtu/hr (300 kW) and fires diesel with a maximum sulfur content of 0.05%. The Alfond Arena Generator is 2.0 MMBtu/hr (150 kW) and fires #2 fuel oil with a maximum sulfur content of 0.5%.

D. Application Classification

The amendment application for the addition of the two new generators to be used for back-up and in a peak demand operating scenario is considered a minor modification, based on calculated emissions using a 500 hour per year limit on each generator. Emissions are below the "Significant Emission Increase Levels" as given in *Definitions Regulation*, 06-096 CMR 100 (last amended December 1, 2005). The inclusion of the two existing generators in the peak demand operating scenario will not increase the currently licensed potential to emit emissions from these two existing units.

This amendment has been processed under *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (last amended December 1, 2005).

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in 06-096 CMR 100. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096

CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

B. New Generators - Recreation Center and Hilltop Commons

The Recreation Center generator is rated at 4.6 MMBtu/hr (400 kW) and the Hilltop Commons generator is rated at 5.8 MMBtu/hr (550 kW). Both generators were manufactured in 2006 and will fire diesel fuel with a sulfur content not to exceed 0.05% sulfur by weight prior to October 1, 2010 and 0.0015% by weight on or after October 1, 2010.

UMaine submitted a BACT analysis for the criteria pollutants from the generators. Based on the size of the units and the annual operating restriction, add-on controls were not considered feasible for economic and environmental reasons. Specifically for NO_X control, selective catalytic reduction (SCR) and fuel injection timing retard (FITR) would not provide a significant environmental benefit and could adversely affect the reliability of the generators in power outage situations. New pollutants could potentially be emitted (ammonia from SCR) or emissions of current pollutants (CO, PM, and opacity from FITR) could increase. For CO and VOC control, oxidation catalysts have been used on large prime power applications, but on generators of limited use, the addition of an oxidation catalyst could affect the reliability of the units with little, or adverse, environmental benefit.

The generators are EPA certified (tier 3 for the Recreation Generator and tier 2 for the Hilltop Generator) and are compliant with New Source Performance Standards.

The following is a BACT analysis summary of the emissions from the Recreation Center and Hilltop Commons generators:

- Particulate Matter (PM and PM_{10}) – based on 06-096 CMR 103: 0.12 lb/MMBtu for each generator; 0.5 lb/hr Recreation Center; and 0.7 lb/hr Hilltop Commons.
- Sulfur Dioxide (SO_2) – based on the use of diesel fuel oil with a sulfur content of no greater than 0.05%; 0.23 lb/hr Recreation Center; and 0.29 lb/hr Hilltop Commons.
- Nitrogen Oxide (NO_X) – based on manufacturer data; 5.93 lb/hr Recreation Center; and 11.72 lb/hr Hilltop Commons.
- Carbon Monoxide (CO) – based on manufacturer data; 0.8 lb/hr Recreation Center; and 0.95 lb/hr Hilltop Commons.
- Volatile Organic Compound (VOC) – based on manufacturer data; 0.12 lb/hr Recreation Center; and 0.13 lb/hr Hilltop Commons.

Opacity – based on 06-096 CMR 101: visible emissions shall not exceed an opacity of 20% on a six (6) minute block average basis, except for no more than two (2) six (6) minute block averages in a 3-hour period.

Each generator is restricted to 500 hours of operation a year based on a 12 month rolling total. Recordkeeping for the generators shall include documentation of the hours of operation both monthly and on a 12 month rolling total basis for each unit. Documentation shall be maintained on the type of fuel used and the fuel sulfur content.

C. ISO New England Peak Demand

UMaine has requested that the generators at the Recreation Center, the Hilltop Commons, the Engineering/Science Center, and the Alfond Arena be allowed to operate during the regional electric power system's peak demand times. The generator in the Agriculture Research Center will also be used for system load reduction purposes, but it is below the licensing threshold and is not included in this amendment. UMaine has proposed a limit of 40 hours per generator per year to be used during peak demand. The 40 hours shall be included in the 500 hours per generator per year limit.

The load restriction based on estimated peak demand is related to ISO New England's Forward Capacity Market (FCM). The FCM was established to fund the projected costs to build new power plants to meet New England's growing demand for electric power. Electricity users make payments to ISO New England based on the facility's electric load at the peak demand of the regional power system. The facility's power consumption during the system peak is referred to as their ICAP tag, which is used to determine the electricity user's FCM payment for the following year. By operating the generators to reduce the facility's load on ISO New England's grid and by voluntary conservation measures (reducing air conditioning load), UMaine expects a reduction of approximately 1300 kW of demand during the system's peak hour. This will reduce UMaine's monthly FCM payment to ISO New England. UMaine has stated that it is critical to reduce electrical costs. It will also result in a more stable and reliable bulk power system and will assist ISO New England in meeting its overall system load requirements and provide the hope that large scale power outages become less likely.

In order to reduce the ICAP tag, the power consumer must ensure that its load is reduced during the peak system hour. Monitoring and forecasting of the electric power system is required, with the possibility that the consumer reduce its load more than once during the year to ensure that the peak is captured. There may be two or three predicted peaks prior to the actual event. An event may include more than one actual day. The generators will be started up and operated for a brief

period of time prior to the actual start of the predicted peak event and will be taken off-line once the predicted peak hour has passed.

UMaine's generators will not be in the ISO New England Demand Response Program, which includes a specific established OP-4 procedure for ISO New England capacity deficiencies. However, operations may coincide with conditions under which ISO New England initiates OP-4 procedures.

Emissions from the use of each of the four generators for 40 hours per year is calculated to be less than a total of 1 ton/year for all criteria pollutants combined.

The Department approves the use of the four generators for generator maintenance purposes, situations arising from sudden and reasonably unforeseeable events beyond the control of UMaine, and also for load reductions to the power system during predicted peak demand. Within the 500 hour per year operating limit, the generators at the Recreation Center, the Hilltop Commons, the Engineering/Science Center, and the Alfond Arena shall be limited to no more than 40 hours of load reduction on a 12 month rolling total per generator. As part of the monthly and 12 month rolling total generator use records, the hours of operation during peak demand times shall be specified with documentation supplied from a third party indicating that UMaine was advised to reduce its load for this purpose during those dates and times.

After two years from the signature of this license, the Department shall re-evaluate the use of the four generators for load reduction purposes based on a review of the unit operating times data.

D. Annual Emissions

UMaine shall be restricted to the following annual emissions from the two generators, based on a 500 hours/year operating restriction per generator:

Tons/year
(used in the annual license fee calculation)

	PM	**PM_{10}**	**SO_2**	**NO_x**	**CO**	**VOC**
Recreation Center Generator	0.13	0.13	0.06	1.5	0.20	0.03
Hilltop Commons Generator	0.18	0.18	0.07	2.9	0.24	0.03

III. AMBIENT AIR QUALITY ANALYSIS

According to 06-096 CMR 115, the level of air quality analyses required for a minor modification shall be determined on a case-by case basis. Based on the information available in the file, and the similarity to existing sources, Maine Ambient Air Quality Standards (MAAQS) will not be violated by this source.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-204-77-1-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the standard and special conditions below.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

(1) **Generators – Recreation Center and Hilltop Commons**

A. UMaine shall limit the Recreation Center (4.6 MMBtu/hr) and Hilltop Commons (5.8 MMBtu/hr) generators to 500 hr/yr of operation each (based on a 12 month rolling total). An hour meter shall be maintained and operated on each of the generators. [06-096 CMR 115, BACT]

B. The Recreation Center and Hilltop Commons generators shall fire fuel oil with a sulfur content not to exceed 0.05% by weight. Beginning October 1, 2010, the Recreation Center and Hilltop Commons generators shall fire fuel oil with a sulfur content not to exceed 0.0015% by weight. UMaine shall keep records of the type of fuel delivered and records indicating that the sulfur content of the fuel meets the limits established by this license. [06-096 CMR 115, BACT]

C. Emissions from the generators shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Recreation Center Generator	PM	0.12	06-096 CMR 103
Hilltop Commons Generator	PM	0.12	06-096 CMR 103

D. Emissions from the generators shall not exceed the following [06-096 CMR 115, BACT]:

Emission Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Recreation Center Generator	0.5	0.5	0.23	5.93	0.80	0.12
Hilltop Commons Generator	0.7	0.7	0.29	11.72	0.95	0.13

E. Visible emissions from each generator shall not exceed 20% opacity on a six (6) minute block average, except for no more than two (2) six (6) minute block averages in a continuous 3-hour period. [06-096 CMR 101]

(2) **Generator Operation - Recreation Center, Hilltop Commons, Engineering/Science Center, and Alfond Arena**

A. The generators at the Recreation Center, the Hilltop Commons, the Engineering/Science Center, and the Alfond Arena may be used for generator maintenance purposes, situations arising from sudden and reasonably unforeseeable events beyond the control of UMaine, and during times when the regional electrical power system is predicted to be at or near its annual peak.

B. Peak Load Operation

1. Within the 500 hour per year operating limit per generator, the four generators shall be limited to no more than 40 hours peak load reduction operation for each 12 month rolling total per generator. UMaine shall keep records for peak load reduction operation which include the date, the name(s) of the generator(s) operated, the hours of operation for each generator, and documentation from a third party indicating that UMaine was advised to reduce its load for predicted peak system demand during those dates and times.

2. The requirement allowing for the 40 hour peak load reduction operation of the four generators shall expire on December 31, 2010. UMaine may submit an application, which would include actual operational data from the four

generators over the time period from date of signature of this license until the end of 2010, with a request for the Department to re-evaluate the use of the four generators for load reduction purposes.

[06-096 CMR 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF , 2008.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:_____
DAVID P. LITTELL, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: September 6, 2007
Date of application acceptance: September 6, 2007

Date filed with the Board of Environmental Protection: _____

This Order prepared by Kathleen E. Tarbuck, Bureau of Air Quality.